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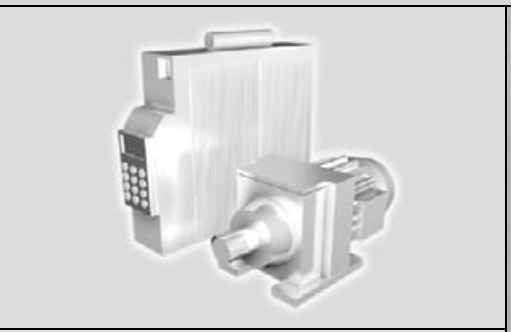
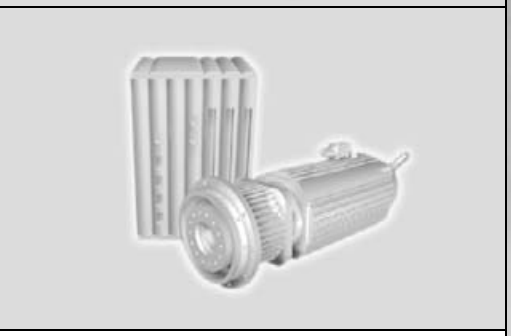
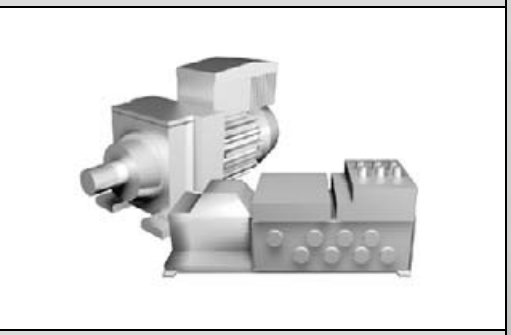
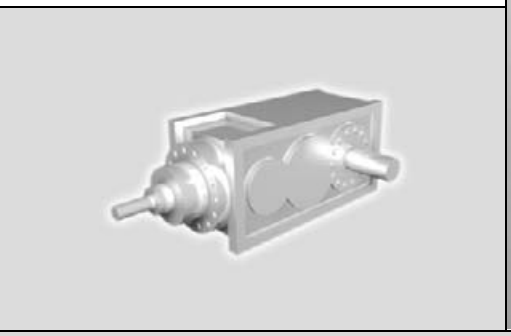








Stationary Energy Supply MOVITRANS® TPS10A Stationary Converters

GC430000

Edition 09/2004

11304812 / EN

Operating Instructions

SEW
EURODRIVE

1 Important Notes

Safety and warning notes

Always observe the safety and warning instructions in this publication!

Hazard
Possible consequences: Severe or fatal injuries.

Hazardous situation
Possible consequences: Slight or minor injuries.

Harmful situation
Possible consequences: Damage to the drive and the environment.

Tips and useful information.

A requirement of fault-free operation and fulfillment of any rights to claim under guarantee is that you adhere to the information in the **operating instructions**. **Read the operating instructions** before you start operating the unit!

The **operating instructions** contain **important information about service** and should be kept **in the vicinity of the unit**.

Designated use

MOVITRANS® TPS10A stationary converters are intended for use in industrial and commercial systems for the operation of contactless power transmission systems. Only connect suitable components to the stationary converter that have been specifically designed for this purpose, such as the MOVITRANS® TAS10A transformer module.

MOVITRANS® TPS10A stationary converters are designed to be installed in control cabinets. Observe all instructions on the technical data and the permitted conditions where the unit is operated.

Do not start up the unit (take it into operation in the designated fashion) until you have established that the machine complies with the EMC Directive 89/336/EEC and that the conformity of the end product has been determined in accordance with the Machinery Directive 89/392/EEC (with reference to EN 60204).

The rules and regulations of the Professional Association (Berufsgenossenschaft, BG), in particular BG rule B11 "Electromagnetic fields", must be observed during installation, startup and operation of systems with contactless energy transfer by induction **for use in industrial workplaces**.

Operational environment

The following uses are forbidden, unless measures are expressly taken to make them possible:

- In explosion-proof areas
- In areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.
- In non-stationary applications with mechanical vibration and shock loads exceeding the values stipulated in EN 50178

Waste disposal

Please follow the latest instructions: Dispose of the following materials in accordance with the regulations in force:

- Electronics scrap (circuit boards)
- Plastic (housing)
- Sheet metal
- Copper

etc.

2 Safety Notes

Installation and startup

- **Never install damaged products or take them into operation.** Submit a complaint to the shipping company immediately in the event of damage.
- **Installation, startup and service work** to be executed by **trained personnel** only observing applicable accident prevention guidelines and the regulations in force (e.g. EN 60204, VBG 4, DIN-VDE 0100/0113/0160).
- Follow the **specific instructions** during **installation** and **startup** of the other components!

- Ensure that **preventive measures** and **protection devices** apply with the **applicable regulations** (e.g. EN 60204 or EN 50178).

  Required preventive measures: Grounding the unit

  Required protection device: Overcurrent protection devices
- **The unit meets all requirements for safe disconnection** of power and electronics connections in accordance with EN 50178. **All connected circuits** must also **satisfy the requirements for safe disconnection**.
- Take **appropriate measures** (for example, connect binary input DIØØ "/CONTROLLER INHIBIT" to DGND) to ensure that the system does not startup unintentionally **when power is switched on.**

Operation and Service

- **Before removing the protective cover**, **disconnect the unit from the supply system**. **Dangerous voltages** may still be present for up to **10 minutes after disconnection from the power supply source**.

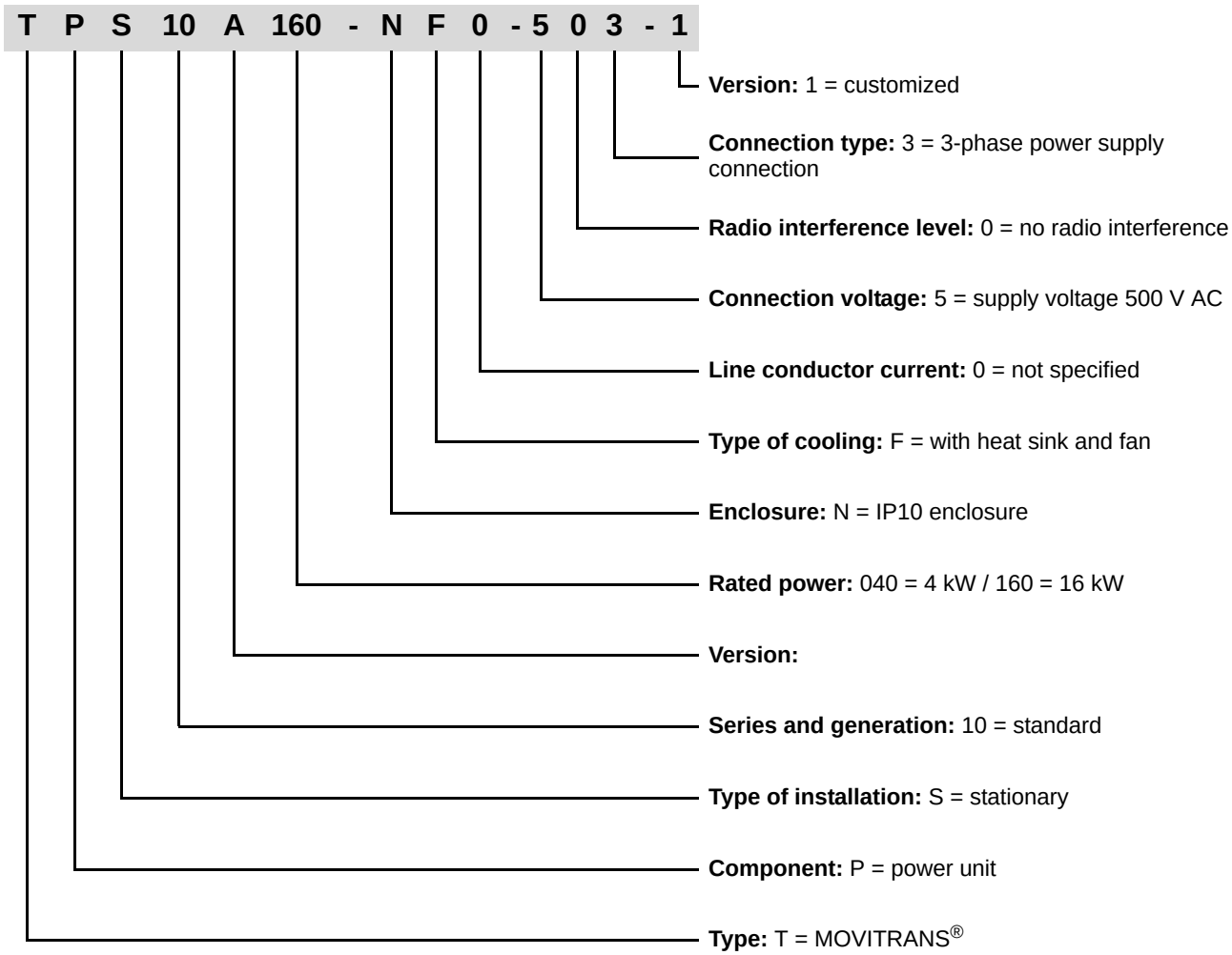
- The unit has **IP00** enclosure with **removed protective cover**. **Dangerous voltages** are present at all subassemblies except for the control electronics. The unit must be closed during operation.
- When the **unit is switched on**, **dangerous voltages** are present at the **output terminals** as well as any **connected cables and terminals**. This is also the case when the unit is inhibited.
- The fact that the **status LED V1** and other display elements are no longer illuminated does **not indicate** that the unit has been disconnected from the power supply and **does not carry any voltage**.

- **Safety functions within the unit** may cause **system standstill**. **Removing the source of the malfunction** or performing a **reset** can result in an **automatic restart of the system**. If safety reasons **prohibit**, this action, **disconnect the unit** from the power supply **before correcting the fault**.

3 Installation

3.1 Type designation, nameplates and scope of supply

Sample type designation



Sample nameplate

The nameplate is attached to the side of the unit.

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Figure 1: MOVITRANS® TPS10A nameplate (example)

Furthermore, a type label is attached to the front of the control unit (above the TERMINAL option slot).

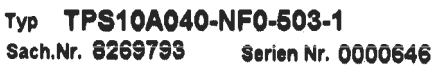

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Figure 2: MOVITRANS® TPS10A type label (example)

Scope of delivery

- Power section with control unit
- In addition for size 2 (TPS10A040): One (1) power shield clamp
- In addition for size 4 (TPS10A160): Two (2) touch guards for the power terminals

3.2 Unit design size 2 (TPS10A040)

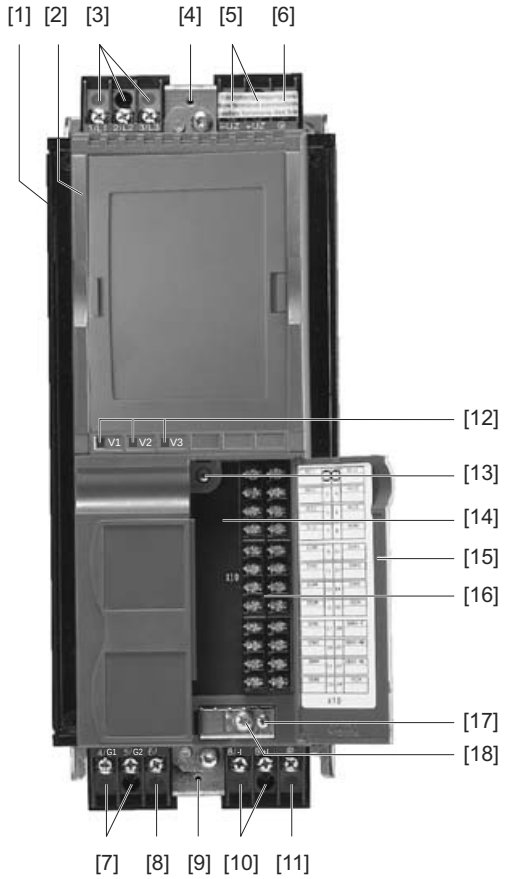

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Figure 3: MOVITRANS® TPS10A040 unit design

[1] Power section
[2] Control unit
[3] X1: Power supply connection L1 (1) / L2 (2) / L3 (3)
[4] X5: Connection for power shield clamp
[5] X4: Connection for DC link connection $-U_Z$ / $+U_Z$
[6] X4: PE connection (⏚)
[7] X2: Gyrator connection G1 (4) / G2 (5)
[8] Terminal has no function
[9] X6: Connection for power shield clamp
[10] X3: Current feedback -I (6) / +I (9)
[11] X3: PE connection (⏚)
[12] Operation LEDs V1 / V2 / V3
[13] Retaining screw A for terminal unit
[14] Terminal unit for control leads, detachable
[15] Flap on terminal unit with labeling tile
[16] X10: Electronics terminal strip
[17] Retaining screw B for terminal unit
[18] Screw for electronics shield clamp

3.3 Unit design size 4 (TPS10A160)

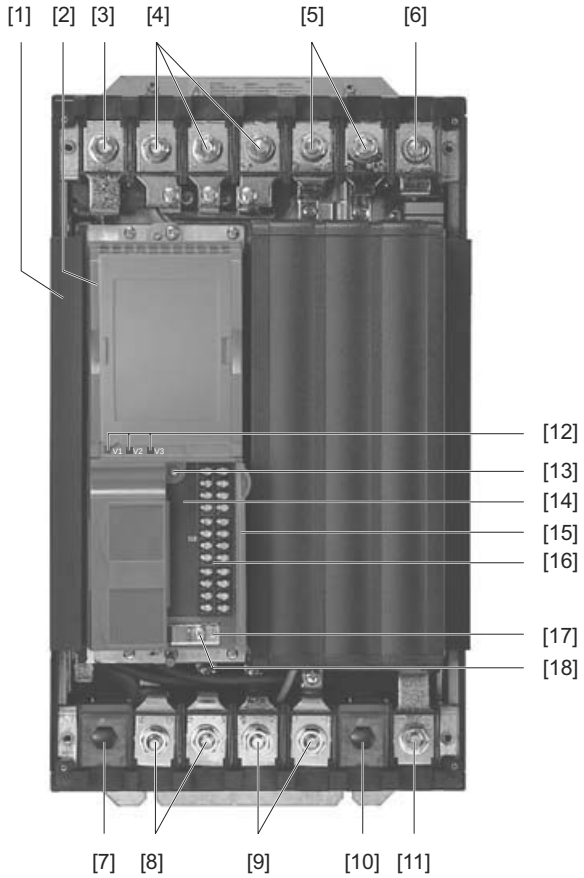

Figure 4: MOVITRANS® TPS10A160 unit design

[1] Power section
[2] Control unit
[3] X1: PE connection (⏚)
[4] X1: Power supply connection L1 (1) / L2 (2) / L3 (3)
[5] X4: Connection for DC link connection $-U_Z$ / $+U_Z$
[6] X4: PE connection (⏚)
[7] Terminal has no function
[8] X2: Gyrator connection G1 (4) / G2 (5)
[9] X3: Current feedback -I (6) / +I (9)
[10] Terminal has no function
[11] X3: PE connection (⏚)
[12] Operation LEDs V1 / V2 / V3
[13] Retaining screw A for terminal unit
[14] Terminal unit for control leads, detachable
[15] Flap on terminal unit with labeling tile
[16] X10: Electronics terminal strip
[17] Retaining screw B for terminal unit
[18] Screw for electronics shield clamp

3.4 Serial interface option type USS21A (RS-232)

Part number 822 914 7

Description The MOVITRANS® TPS10A stationary converter can be fitted with the isolated interface RS-232. The RS-232 interface is designed as a 9-pole sub-D socket (EIA standard). The interface is accommodated in a housing to be plugged into the inverter (TERMINAL option slot). The option can be plugged in during operation. The transmission rate of the RS-232 interface is 9600 baud.

Startup, operation and service are possible from the PC via the serial interface. The SEW SHELL TPS software is used for this.

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Figure 5: MOVITRANS® TPS10A control unit with serial interface type USS21A (RS-232)

[1] Serial interface option type USS21A (RS-232)
[2] Control unit

3.5 Installation notes

It is essential to comply with the safety notes during installation!

Tightening torques

- Only use **genuine connection elements**.

  Note the tightening torques of the power terminals:

  Size 2 (TPS10A040) → 1.5 Nm (13.3 lb.in)

  Size 4 (TPS10A160) → 14 Nm (124 lb.in)

Recommended tools

- Only use the following tools to connect the X10 electronics terminals strip. Other tools will destroy the screw head.
  - Phillips Posidrive screwdriver size 1 to DIN 5262 PH1
  - Slotted screw driver according to DIN 5265, size 4.0 × 0.8 or 4.5 × 0.8

Minimum clearance and mounting position

- Leave at least **100 mm (4 in) clearance at the top and bottom** for optimum cooling. For project planning refer to the section "Technical Data." No clearance is required at the sides; the units can be lined up in rows. With size 4 (TPS10A160), do not install any components that are sensitive to high temperatures less than 300 mm (11.81 in) above the unit.

  Install the units **vertically**. You must not install them horizontally, tilted or upside down!

Supply system contactor

- Only use **supply system contactors (K11)** of **utilization category AC3 (IEC 158-1)**.

Line choke

- **More than four units on an input contactor** for the total current:

  Insert a 3-phase line choke in the circuit to limit the inrush current.

Separate cable ducts

- Route **power leads and electronics leads** in **separate cable ducts**.

Input fuses and earth leakage circuit breakers

- Install **input fuses for the line protection (no unit protection) at the beginning of the supply system lead** behind the supply bus junction. Use D, DO, NH or circuit breakers.

  One **earth leakage circuit-breaker** as **sole protection device** (exception: all-current sensitive earth leakage circuit-breaker) is **not permissible**. **Earth-leakage currents > 3.5 mA** can arise during normal inverter operation.

PE power supply connection (→ EN 50178)

- If the supply system lead is < 10 mm^2 (AWG8), route a second PE conductor with the cross section of the supply system lead in parallel to the protective earth using separate terminals. Alternatively, use a protective earth conductor with a cross section of 10 mm^2 (AWG8) Cu. If the supply system lead is ≥ 10 mm^2 (AWG8), use a Cu protective earth conductor with the cross section of the supply system lead.

Line filter

- A **line filter is required** to comply with class A limit according to EN 55011 and EN 55014 (→ Sec. "Technical Data"):

  NF014-503 (part number: 827 116 X) for MOVITRANS® TPS10A040

  NF035-503 (part number: 827 128 3) for MOVITRANS® TPS10A160
- **Install** a line filter **close** to the unit **outside the minimum clearance**.
- **Limit the length of the cable between the line filter and unit** to the absolute minimum needed.
- Use **twisted and shielded cables** for long distances **between the control cabinet and line filter** and between the **line filter and unit**.

IT systems

- SEW-EURODRIVE recommends using **earth-leakage monitors with pulse-code measurement** for power supply systems with a non-grounded star point **(IT systems)**. This step will prevent the earth-leakage monitor from triggering accidentally due to the grounding capacities of the inverter.

Cross sections

- Supply system lead: **Line cross section according to nominal input current** I_{mains} at rated load.
- Line cross section between X2/X3 of the TPS10A stationary converter and X2/X3 of the TAS10A transformer module:
  - Size 2 (TPS10A040)→ 4 mm^2
  - Size 4 (TPS10A160) → 16 mm^2
- Electronics cables:
  - One core per terminal 0.20...2.5 mm^2 (AWG24...12)
  - Two cores per terminal 0.20...1 mm^2 (AWG24...17)

Unit output

- Only connect **valid components** to the unit, such as the MOVITRANS® TAS10A transformer module.

Binary inputs / binary outputs

- **Binary inputs** are **electrically isolated** by optocouplers. **Binary outputs** are **short-circuit proof** but **not protected against external voltage**. External voltages can cause irreparable damage!

Shielding and earthing

- SEW EURODRIVE recommends that you **shield** the **control cables**.
- **Connect the shield** by the shortest possible route and make sure it is **earthed over a wide area at both ends**. To avoid ground loops, you can ground one end of the shield via a suppression capacitor (220 nF / 50 V). If using double-shielded cables, earth the outer shield on the unit end and the inner shield on the other end.
- You can also route the cables in grounded sheet metal ducts or metal tubes for shielding purposes. Install the power and signal lines separately.
- Ground the **MOVITRANS® and all additional devices to meet the high-frequency guidelines**. To do so, provide a wide area metal-on-metal contact between the unit housing and ground (e.g. unpainted control cabinet mounting panel).

3.6 UL compliant installation

Note the following points for UL compliant installation:

- Only use copper cables with the **following temperature ranges** as connection cables:
  - For MOVITRANS® TPS10A (size 2 and 4) temperature range 60/75 °C

- **Permitted tightening torques** for MOVITRANS® power terminals:
  - TPS10A040 (size 2) → 1.5 Nm (13.3 lb.in)
  - TPS10A160 (size 4) → 14 Nm (124 lb.in)

- MOVITRANS® TPS10A stationary converters are **suitable for operation on voltage supply systems with grounded star point** (TN and TT nets) supplying a maximum supply current according to the following tables and with a maximum voltage of 500 V_{AC}. Only use fuses as the main safety feature. The performance data of these fuses must not exceed the values in the table.

MOVITRANS® TPS10A	Max. supply current	Max. supply voltage	Fuses
040 (size 2)	5000 A_{AC}	500 V_{AC}	110 A / 600 V
160 (size 4)	10000 A_{AC}	500 V_{AC}	350 A / 600 V

- Only use tested units with a **limited output voltage** (V_{max} = 30 V_{DC}) and **limited output current (I ≤ 8 A) as the external 24 V_{DC} voltage source**.

- **UL certification does not apply to operation in voltage supply systems with a non-earthed star point (IT systems).**

3.7 Touch guard

Touch guard

The MOVITRANS® TPS10A160 (size 4) units include two (2) touch guard elements and eight (8) retaining screws as standard. Install the touch guard on both covers of the power section terminals.

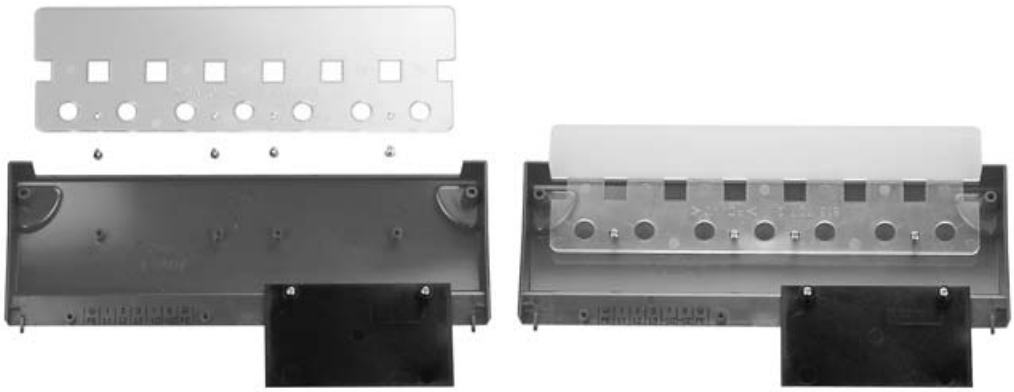

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Figure 6: Touch guard for MOVITRANS® TPS10A160

The MOVITRANS® TPS10A160 units have an enclosure rating of IP10 with and IP00 without the touch guard.

3.8 Wiring diagram, size 2 (TPS10A040)

Power section, size 2

Connect the power section of the MOVITRANS® TPS10A040 stationary converter as follows:

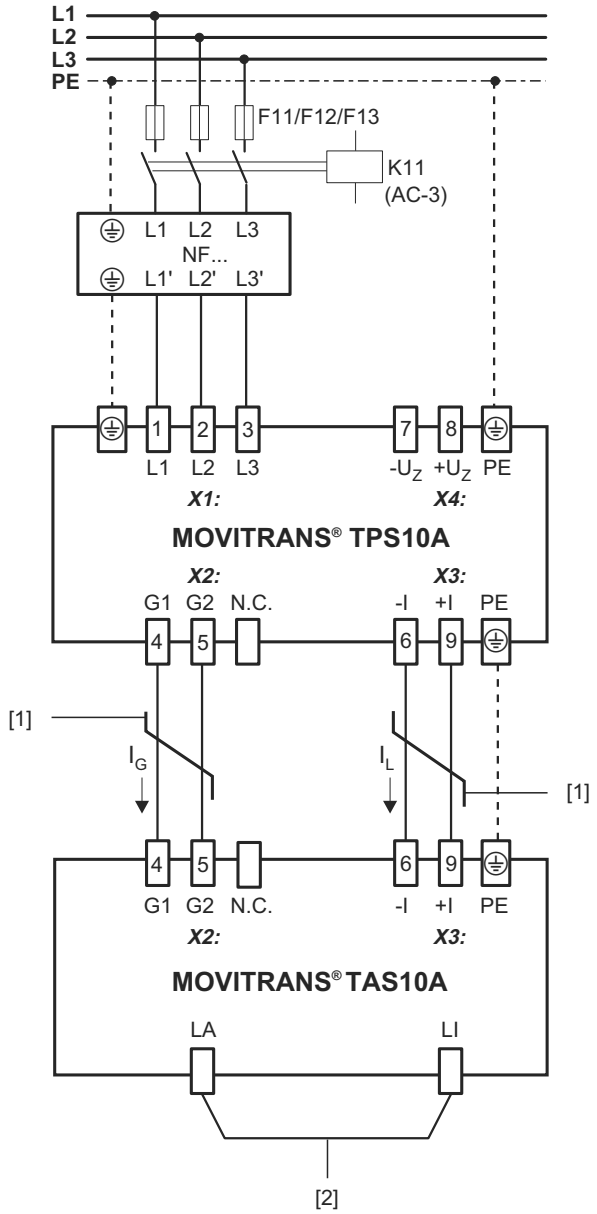

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Figure 7: Power section wiring diagram for MOVITRANS® TPS10A040

[1] Twisted cables
[2] Short-circuit hoop (for startup of TPS10A040 **without** connected line cables)

3.9 Wiring diagram, size 4 (TPS10A160)

Power section, size 4

Connect the power section of the MOVITRANS® TPS10A160 stationary converter as follows:

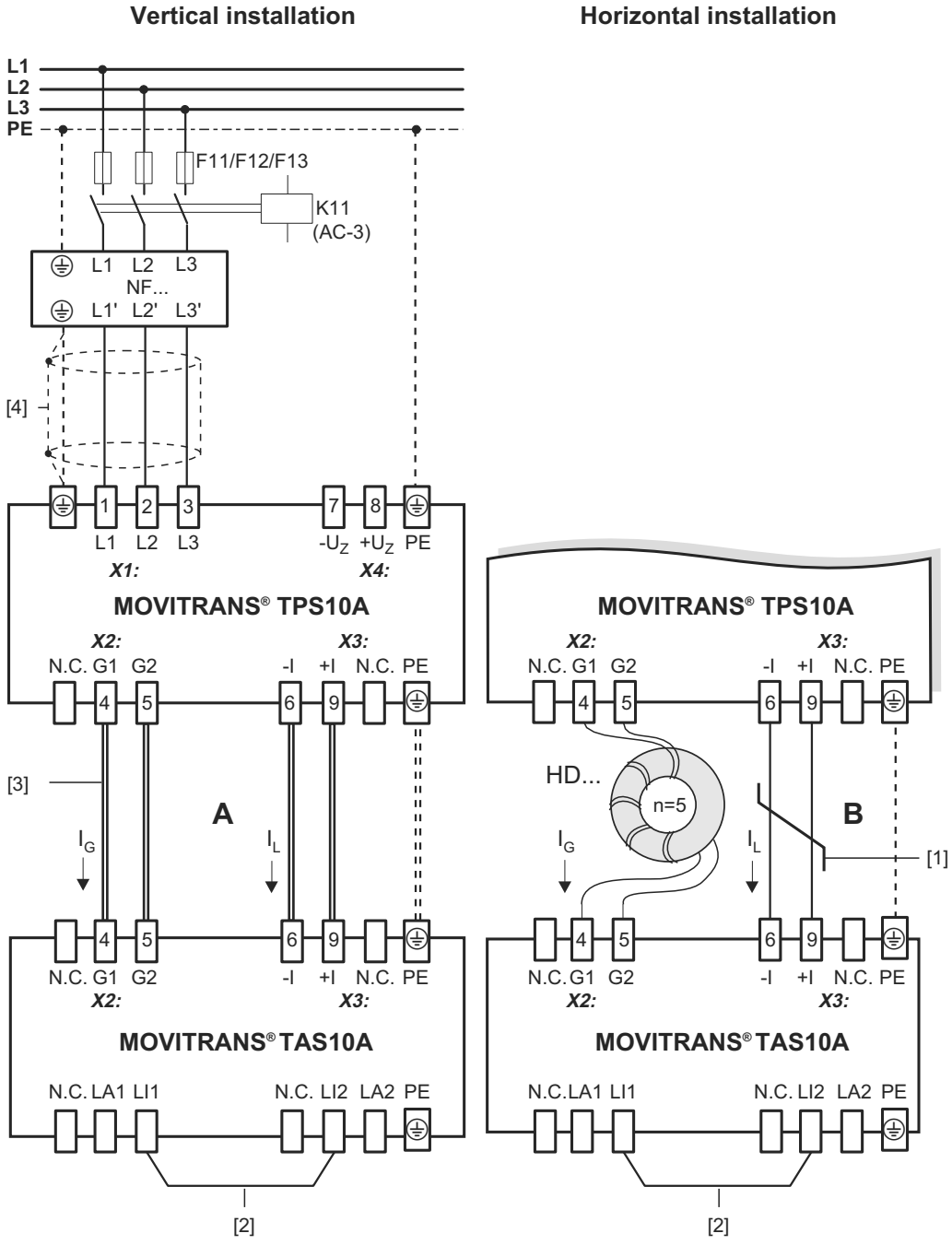

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Figure 8: Power section wiring diagram for MOVITRANS® TPS10A160

[1] Twisted cables
[2] Short-circuit hoop (for startup of TPS10A160 **without** connected line cables)
[3] Connection conductor rail
[4] Shielded cables

A Version A (TAS10A160 connected to TPS10A160 using connection conductor rails)
B Version B (TAS10A160 connected to TPS10A160 using twisted cables)

Versions

The TAS10A160 transformer module can be connected to the TPS10A160 stationary converter using version A or B:

Version A

With this version, use standardized connection conductor rails to connect the TAS10A160 transformer module to the TPS10A160 stationary converter. The rails are included in the delivery scope of the TAS10A160 transformer module.

The following figure shows the preferred installation (vertically on top of one another) and the connection of the units using conductor rails:

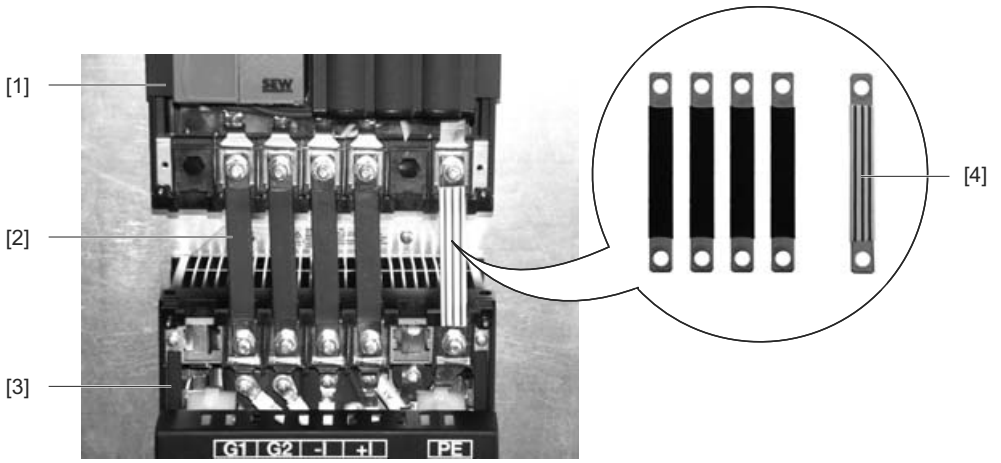

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Figure 9: Connection conductor rails for MOVITRANS® TPS10A160 and TAS10A160

[1] MOVITRANS® TPS10A160 stationary converter
[2] Connection conductor rails
[3] MOVITRANS® TAS10A160 transformer module
[4] Connection conductor rails (detail view)

For more information on this topic, refer to the "MOVITRANS® TAS10A Transformer Module" operating instructions.

Version B

With this version, you use twisted cables and connect the output choke HD003 at output X2:G1/G2 to link the TAS10A160 transformer module to the TPS10A160 stationary converter.

Output choke	**HD003**
Part number	813 558 4
Inside diameter d	88 mm (4.46 in)
For line cross sections	≥ 16 mm^2 (AWG 6)

3.10 Wiring diagram for control unit (TPS10A)

Control unit, size 2 and 4

Connect the control unit of the MOVITRANS® TPS10A040 or TPS10A160 stationary converter as follows:

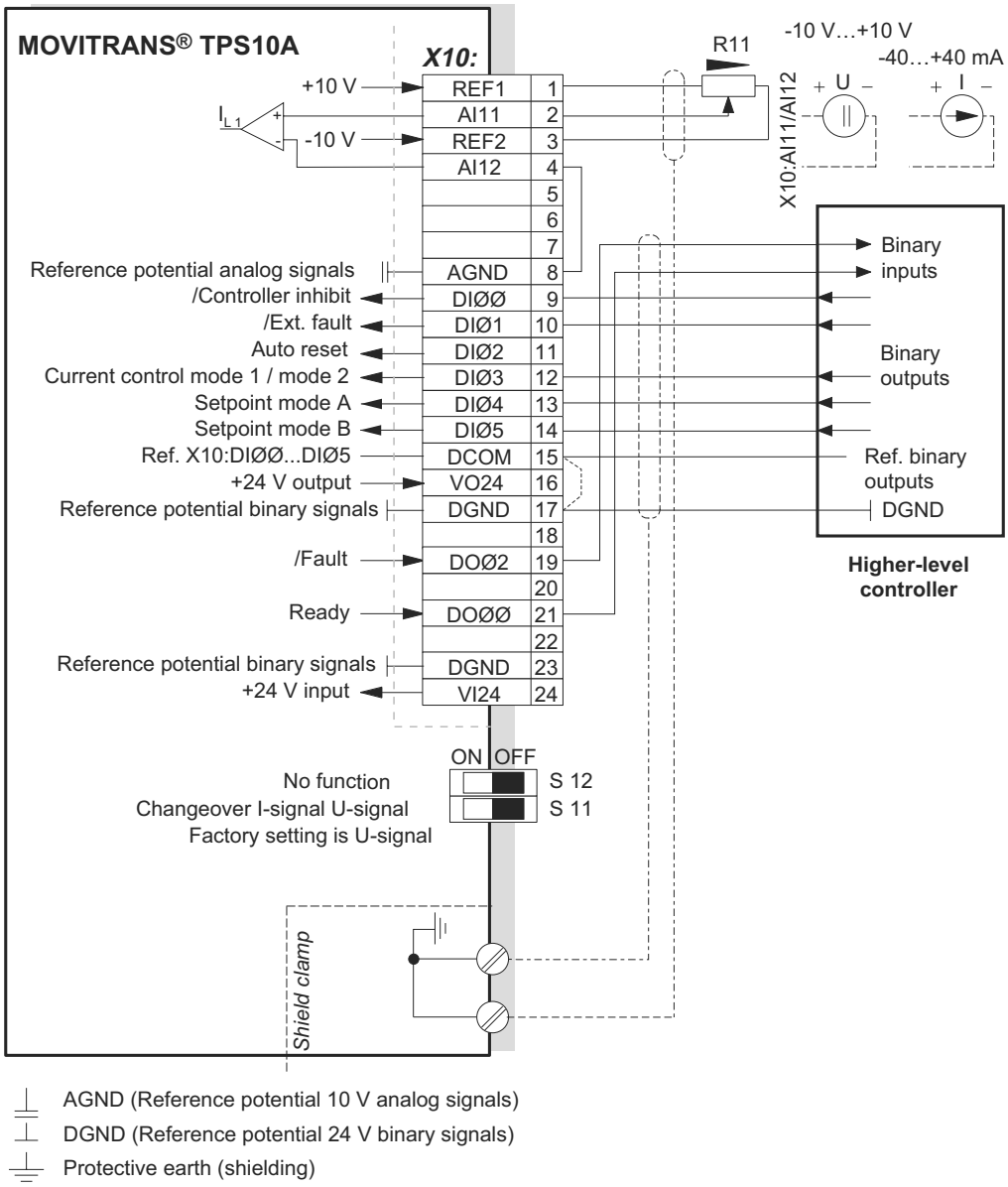

Figure 10: Control unit wiring diagram for MOVITRANS® TPS10A

- If the binary inputs are set with the 24 V DC voltage supply X10:16 "VO24," you must install the X10:15-X10:17 (DCOM-DGND) jumper at the control unit.
- The S11 DIP switch is only accessible when the terminal unit has been removed.
- The resistance $R11_{min}$ must be at least 4.7 kΩ.

Description of terminal functions (power section and control unit)

Terminal		Function	
X1: 1/2/3 **X2: 4/5** **X3: 6/9** **X4: +UZ/-UZ**	**L1/L2/L3** **G1/G2** **–I/+I** **+U_Z/–U_Z**	Power supply connection Gyrator connection Current feedback DC link connection	
X10: 1 **X10: 2/4** **X10: 3** **X10: 5/6/7** **X10: 8**	**REF1** **AI11/AI12** **REF2** **-** **AGND**	Reference voltage +10 V (max. 3 mA) for setpoint potentiometer Setpoint input I_{L1} (differential input), switching between current/voltage input with S11 Reference voltage –10 V (max. 3 mA) for setpoint potentiometer No function Reference potential for analog signals (REF1, REF2, AI11, AI12)	
X10: 9 **X10: 10** **X10: 11** **X10: 12** **X10: 13** **X10: 14** **X10: 15** **X10: 16** **X10: 17**	**DIØØ** **DIØ1** **DIØ2** **DIØ3** **DIØ4** **DIØ5** **DCOM** **VO24** **DGND**	Binary input 1, with fixed assignment /Controller inhibit Binary input 2, with fixed assignment /Ext. fault Binary input 3, auto-reset Binary input 4, with fixed assignment current control mode 1 / mode 2 Binary input 5, with fixed assignment setpoint mode A Binary input 6, with fixed assignment setpoint mode B Reference for binary inputs DIØØDIØ5 Auxiliary supply output +24 V (max. 200 mA) Reference potential for binary signals	The binary inputs are electrically isolated by optocouplers. DCOM has to be connected with DGND, if the binary inputs are set with +24 V from VO24.
X10: 18/20/22	**-**	No function	
X10: 19 **X10: 21** **X10: 23**	**DOØ2** **DOØØ** **DGND**	Binary output 2, with fixed assignment /Fault Binary output 0, with fixed assignment ready for operation Reference potential for binary signals	Load capacity: max. 50 mA
X10: 24	**VI24**	Input +24 V power supply (only required for diagnostic purposes)	
S11 **S12**	**I ↔ U** **-**	AI11/AI12 toggle I signal (–40 ... +40 mA) ↔ V signal (–10 ...+10 V), factory setting: V signal No function	

Assignment of electronics terminals and labeling tile

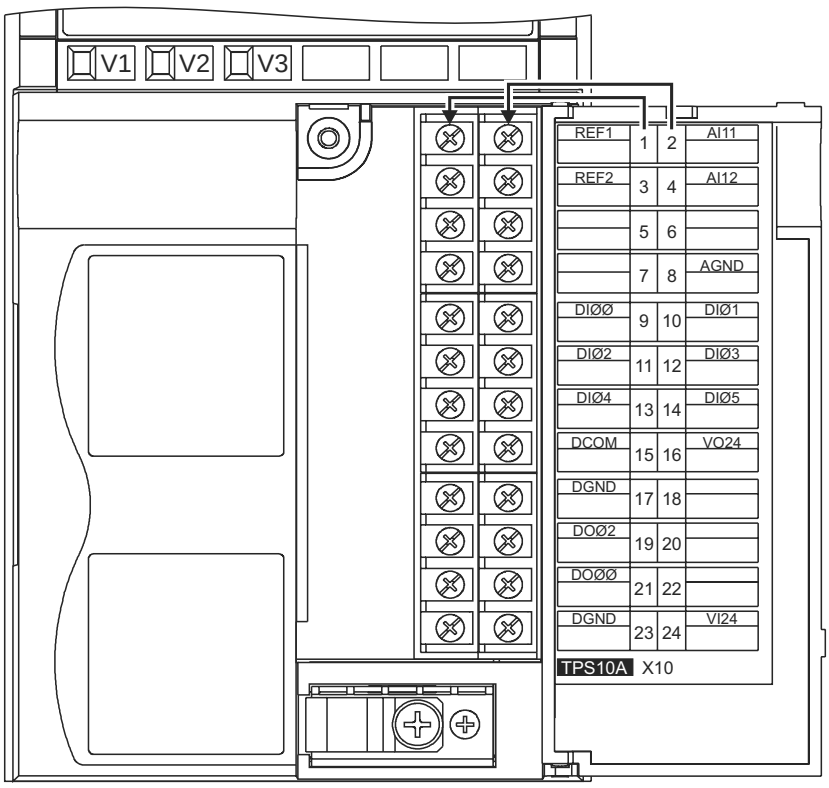

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Figure 11: Electronics terminals and labeling tile

3.11 Installing and removing a terminal unit

Remove or mount terminal unit only with switched off unit (disconnected from power supply)!

You can remove the entire terminal unit from the control module to facilitate installation of the control cables and to easily replace the unit in case it has to be serviced. Proceed as follows:

1. Open the flap on the terminal unit.
2. Loosen retaining screws A and B; they are captive screws and cannot fall out.
3. Remove the terminal unit from the control module.

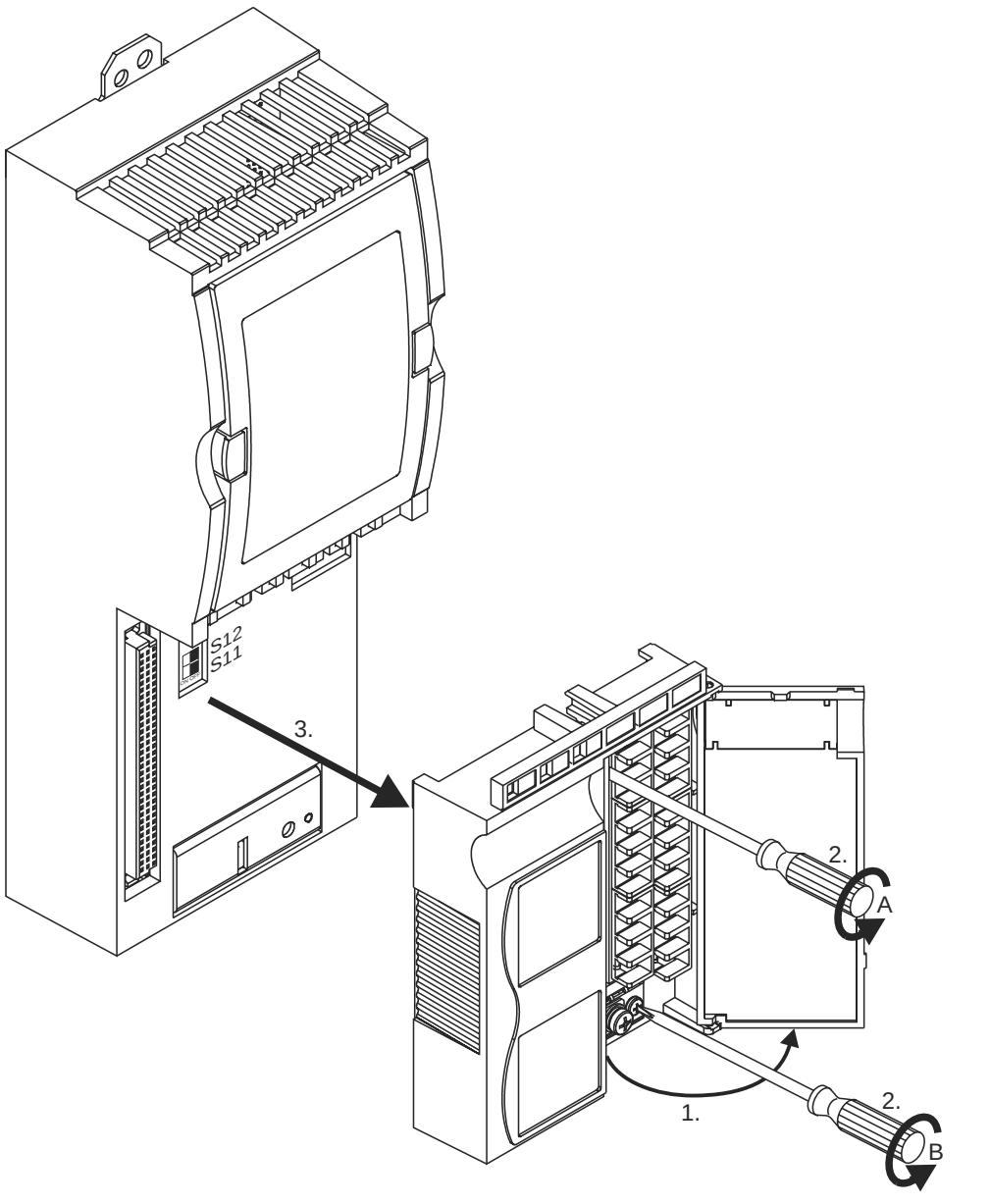

Figure 12: Removing the terminal unit

Follow the instructions in reverse order when replacing the terminal unit.

3.12 Connection of the serial interface option type USS21A (RS-232)

Part number 822 914 7

RS-232 interface To connect a PC to the MOVITRANS® TPS10A option USS21A, use a commercial shielded serial interface cable with a 1:1 connection assignment.

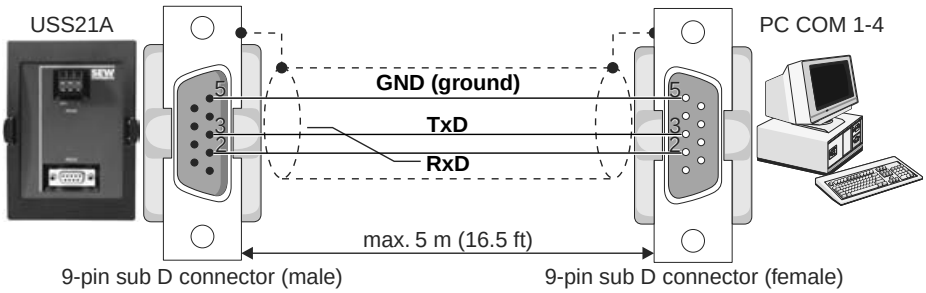

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Figure 13: USS21A PC connection cable (1:1 connection assignment)

4 Startup

- **It is essential to comply with the safety notes during startup!**
- **Correct installation of the unit is a prerequisite for successful startup.**
- **The SEW SHELL TPS software and the operating instructions of the MOVITRANS® TAS10A transformer module are both required for startup. You can use an R11 potentiometer for analog setpoint selection, as described in the section "Wiring diagram for control unit TPS10A".**

4.1 Operating status and setpoint selection

Operating status

The following operating statuses can be set for the TPS10A stationary converter with the binary inputs X10:9 "/controller inhibit" (DIØØ) and X10:12 "Current control mode 1 / mode 2" (DIØ3):

X10:9 (DIØØ)	X10:12 (DIØ3)	Operating status	Operation LED V1
"0"	**-**	Controller inhibit	Steady yellow light
"1"	**"0"**	Enable with current control mode 1	Flashing green-yellow light
"1"	**"1"**	Enable with current control mode 2	Steady green light

Make sure the "controller inhibit" operating status is active for startup (= "0" signal on DIØØ → connect X10:9 with DGND) when the power supply is switched on.

Setpoint selection

The following setpoint selections can be made at the TPS10A stationary converter via binary inputs X10:13 "Setpoint mode A" (DIØ4) and X10:14 "Setpoint mode B" (DIØ5):

Current control mode 1

X10:13 (DIØ4)	X10:14 (DIØ5)	Setpoint selection	Ramp time (Ref. 100 % I_L)	Operation LED V2
"0"	**"0"**	Analog input AI11/AI12 active –10 V ... +10 V (–40 mA ... +40 mA) ≙ 0 ... 100 % I_L	200 ms	Green flashing
"1"	**"0"**	Analog input AI11/AI12 active –10 V ... +10 V (–40 mA ... +40 mA) ≙ 0 ... 100 % I_L	600 ms	Green flashing
"0"	**"1"**	Setpoint 100 % I_L fixed	200 ms	Steady green light
"1"	**"1"**	Setpoint 100 % I_L fixed	600 ms	Steady green light

Current control mode 2

X10:13 (DIØ4)	X10:14 (DIØ5)	Setpoint selection	Ramp time (Ref. 100 % I_L)	Operation LED V2
"0"	**"0"**	Analog input AI11/AI12 active –10 V ... +10 V (–40 mA ... +40 mA) ≙ 0 ... 100 % I_L	20 ms	Green flashing
"1"	**"0"**	Setpoint 100 % I_L fixed	100 ms	Steady green light
"0"	**"1"**	Setpoint 50 % I_L fixed	20 ms	Green-yellow flashing
"1"	**"1"**	Setpoint 100 % I_L fixed	20 ms	Steady green light

In case of a setpoint change, the drive moves to the new setpoint using the respective ramp.

Check that the correct setting has been made for DIP switch S11 with the setpoint selection "analog input AI11/AI12 active."

– I signal for current setpoints –40 mA ... +40 mA
– V signal for voltage setpoints –10 V ... +10 V (factory setting)

The compensation of the line conductor usually takes place during startup. This step requires the variable setting of the load current I_L. This means that you have to set the setpoint selection "analog input AI11/AI12 active" ("0" signal on DIØ4 and DIØ5) and set the initial setpoint 0 % I_L (–10 V or –40 mA on AI11/AI12).

4.2 Startup steps

Track compensation

The inductance of the line conductor increases as the cable length increases.

This **inductive reactance** must be compensated by connecting compensation capacitors in series (**track compensation**).

For more information on this topic, refer to the MOVITRANS® TAS10A transformer module operating instructions in the sections "Wiring diagrams for line conductors on TAS10A040" and "Wiring diagrams for line conductors on TAS10A160".

Step-by-step startup procedure

Perform the following steps to ensure successful startup:

1. Set an "0" signal on DIØØ "/controller inhibit.".
2. Set an "0" signal on DIØ4 and DIØ5 (setpoint selection "analog input AI11/AI12 active").
3. Set setpoint 0 % I_L (–10 V or –40 mA on AI11/AI12).
4. Switch on the supply voltage.
5. Start the SEW SHELL TPS software.
6. From the main menu, choose [Connection] / [Connect].
7. In the [Select Interface] window select the PC interface (PC com) that the MOVITRANS® TPS10A stationary converter is connected to.
8. From the main menu, choose [Startup] / [Compensation].
9. In the [Compensation] window, choose the line conductor current from the selection list [Nominal line conductor current at 100 % setpoint] for the system in question.

   The value corresponds to the rated output current of the MOVITRANS® TAS10A transformer module and is used to calculate the absolute compensation error correctly.
10. From the main menu, choose [Display Values] / [Process Values].
11. In the [Process Values] window, check the following values:
    - Fault Status = No fault
    - Output Current = 0.0 A
12. If required, change your settings as follows:
    - Ensure that a "1" signal is set at binary input "/Ext. fault" X10:10 (DIØ1) (Fault status = No external fault).
    - Set a "1" signal on DIØØ (Output stage = Enabled).
    - Set the desired setpoint with the voltage source (current source) on AI11/AI12: –10 V ... +10 V (–40 mA ... +40 mA) ≙ 0 ... 100 % I_L.
13. Carry out compensation of the line conductor:
    - Ensure that no real power can be transmitted while the measurement is taken.
    - Proceed as described in the flow diagram on the following page.
14. Choose the setpoint as required after compensation has been performed for the line conductor.

    For more information on this topic, refer to the section "Technical Data" in these operating instructions or the sections "Technical Data" and "Compensation Capacitors" in the operating instructions for the MOVITRANS® TAS10A transformer module.

Flow diagram Proceed as follows to determine the track compensation:

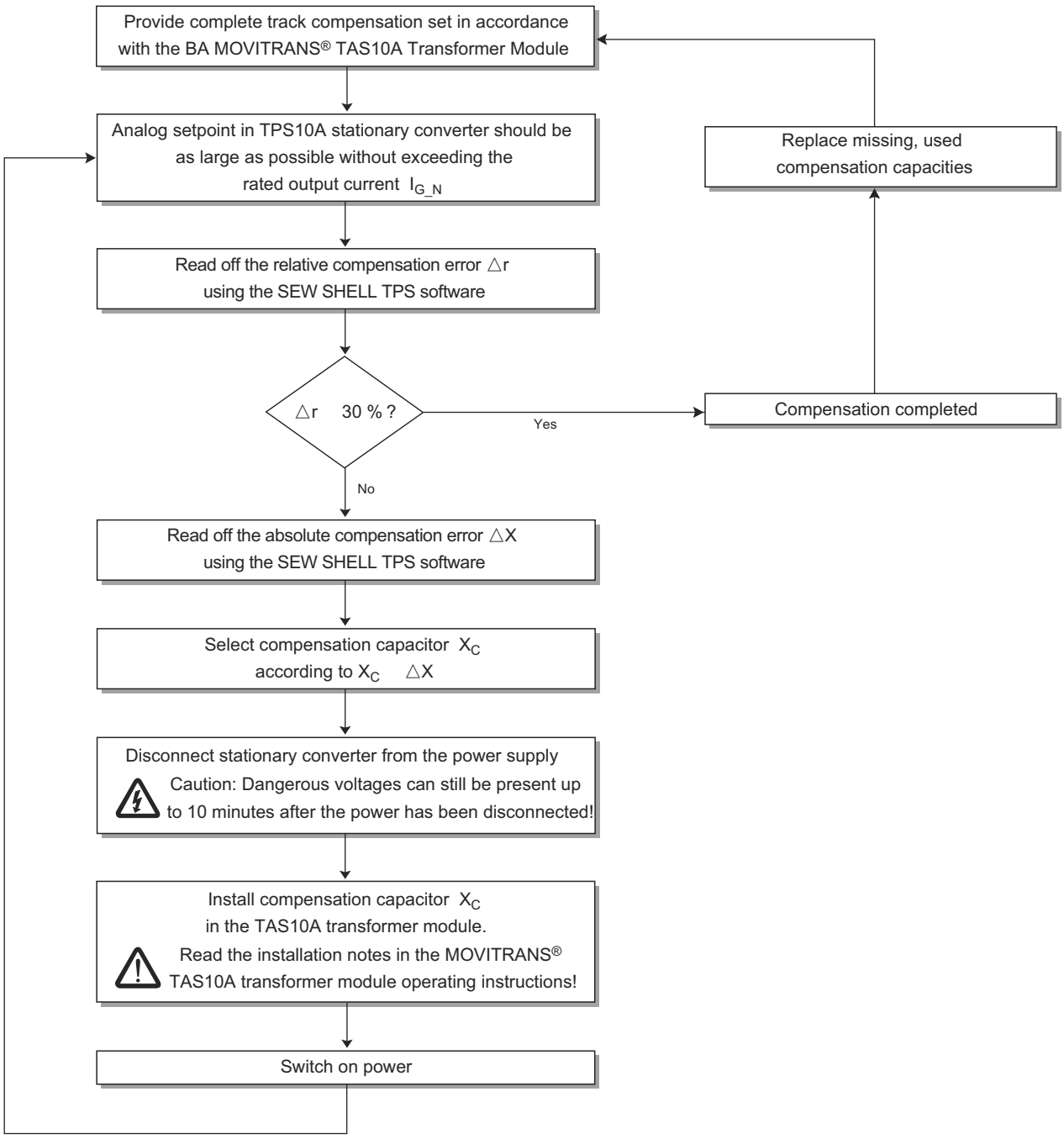

Figure 14: Track compensation for the MOVITRANS® TPS10A stationary converter

5 Operation and Service

5.1 Operation displays

Operation LEDs

Operating status, setpoint modes and error messages of the MOVITRANS® TPS10A are indicated by the three-color (green/yellow/red) LEDs V1, V2 and V3.

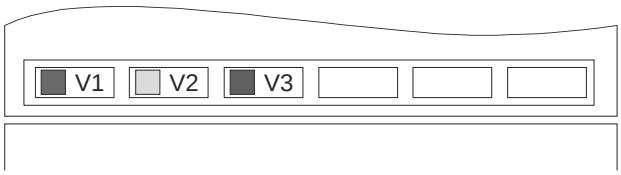

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Figure 15: Operation LEDs V1, V2 and V3

V1: Operating status

The operation LED V1 indicates the operating status of the unit.

V1 color		Operating status	Description
-	**OFF**	No voltage	No supply voltage and no 24 V_{DC} backup voltage.
Yellow	**Steady light**	Output stage inhibit	Unit ready but output stage inhibit active (DIØØ = "0").
Yellow-green	**Flashing**	Enable with current control mode 1	Output stage enabled, current control mode 1 active (DIØØ = "1" and DIØ3 = "0").
Green	**Steady light**	Enable with current control Mode 2	Output stage enabled, current control mode 2 active (DIØØ = "1" and DIØ3 = "1").
Red	**Steady light**	System error	Fault triggers output stage inhibit

V2: Setpoint specification

The operation LED V2 indicates which setpoint selection is active:

V2 color		Setpoint selection	Description
Green	**Flashing**	Analog input AI11/AI12 active	–10...+10 V (–40 ... +40 mA) = 0...100 % I_L
Yellow-green	**Flashing**	50 % I_L fixed value	Fixed setpoint selection
Green	**Steady light**	100 % I_L fixed value	

V3: Fault messages

The operation LED V3 displays the following fault message if a fault occurs (V1 = red):

Color V3		Fault message and response	X10:21 (DOØØ: Ready)	X10:19 (DOØ2: /Fault)	Cause	Action
Red	**Steady light**	Over-current Output stage inhibit	"0"	"0"	– Short circuit on output – Gyrator impedance is too small – TAS output open – Faulty output stage	– Rectify the short circuit – Connect the correct TAS – Note the wiring diagrams in the TAS operating instructions – Use a short-circuit hoop – Consult SEW Service
Red	**Flashing**	Overtemperature Output stage inhibit	"0"	"0"	Thermal overload of unit	Reduce load and/or ensure adequate cooling.
Yellow/red	**Flashing**	External fault (DIØ1 = "0") Output stage inhibit	"0"	"0"	External fault signal read in via DIØ1.	Remedy external fault and make sure that DIØ1 = "1".
Yellow	**Steady light**	V_Z undervoltage Fault message only No output stage inhibit	"1"	"0"	– Power supply voltage too low – Voltage drop too large on power supply system line – Phase fault of power supply system line (fuse)	– Connect to correct supply voltage (400/500 V) – Design power supply system line so that the voltage drop is relatively small – Check power supply system line and fuses

5.2 Fault reset

Fault reset

Proceed as follows:

- Remove the cause of the fault.
- Carry out the edge change "1"→"0" at the binary input X10:9 DIØØ to trigger a reset.

  or
- Carry out the edge change "1"→"0" at the binary input X10:11 DIØ2 to reset the faults.

The unit is now ready for operation again.

5.3 Auto reset function

Important:

The auto reset function must not be used in systems where the automatic restart represents a risk of injury to persons or damage to equipment!

Function description

The auto reset function of the MOVITRANS® TPS10A stationary converter offers the option of resetting faults automatically when they occur on the unit.

The following faults can be reset:

- "Overcurrent"
- "External fault"
- "Overtemperature"

Switching on/off

The auto reset function is switched on and off via binary input DIØ2:

X10:11 (DIØ2)	Auto reset function
"0"	Off
"1"	On

Auto reset

When an error occurs, the auto reset function resets the system automatically after a fixed time of 50 ms (restart time). A maximum of three successive faults can be reset.

Further auto resets are only possible when a fault reset, as described in the "Fault reset" section, has been performed.

5.4 Overload capacity

Continuous output current

The MOVITRANS® TPS10A stationary converters calculate the load on the inverter output stage permanently (unit utilization). They can output the maximum possible power in any operating status. The permitted continuous output current depends on the ambient temperature, heat sink temperature, supply voltage. If the load on the stationary converter is higher than permitted, the unit outputs the fault message "Overcurrent" (output stage inhibit) and switches off immediately.

Temperature change over time

The following charts show the temperature changes of the units over time and the permitted output currents when V_{mains} = 400 V and V_{mains} = 500 V and the ambient temperatures T_U = 25 °C and T_U = 40 °C.

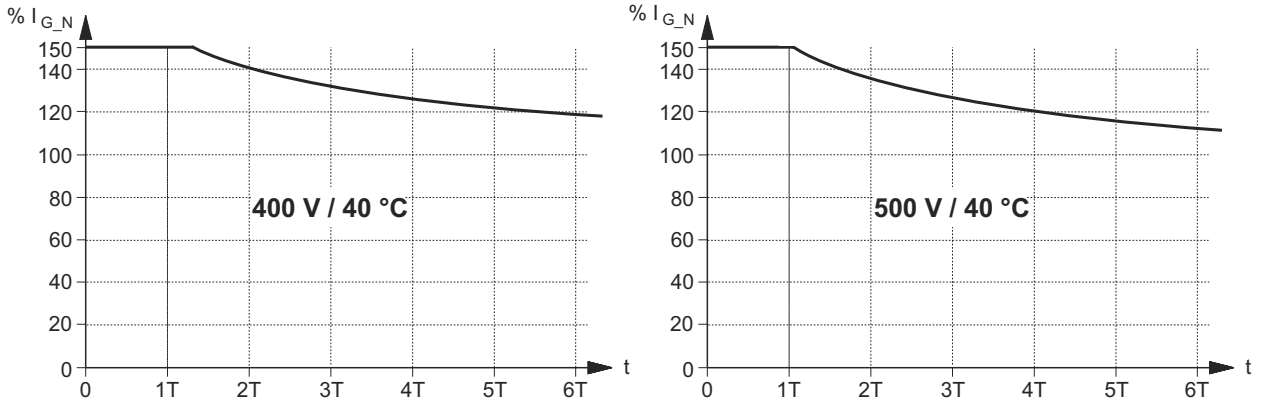

Figure 16: Overload capacity at 40 °C

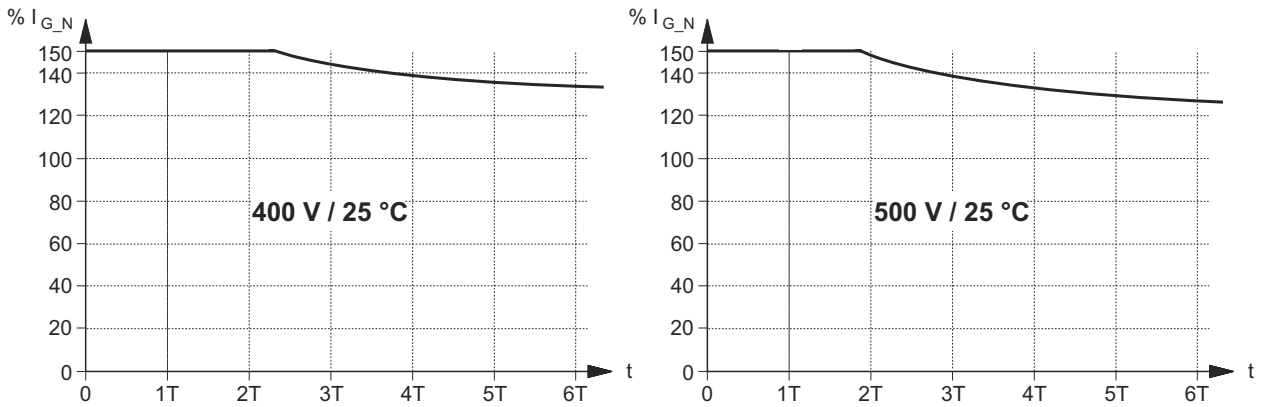

Figure 17: Overload capacity at 25 °C

Load period

The following table shows the time constant T and the rated output current I_{G_N} for sizes 2 and 4:

MOVITRANS® TPS10A	040 (size 2)	160 (size 4)
Time constant T [s]	50	80
Rated output current I_{G_N} [A_{eff}]	10	40

The apparent power is proportional to the output current I_G.

5.5 Cut-off limits

Cut-off limits

The following table shows the load capacity of the units:

Area	Heat sink temperature ϑ	Load capacity
1	0 °C ... 60 °C	The maximum load is 1.8 x I_{G_N}.
2	60 °C ... 90 °C	The maximum load is reduced in linear form to 1.2 x I_{G_limit}.
3	>90 °C	Unit switches off due to overtemperature (output stage inhibit).

When the unit output current I_G exceeds the maximum possible load, the unit switches off due to overcurrent (output stage inhibit).

5.6 Electronics service

Send in for repair

Contact the **SEW-EURODRIVE Electronics Service in Bruchsal** if a fault **cannot be rectified**.

When contacting the electronics service, please always quote the digits of the service code (→ service label).

Provide the following information when sending the unit in for repair:
– Serial number (→ nameplate) – Type designation – Service code (→ service label) – Brief description of the application – Connected load (gyrator impedance) – Nature of the error – Accompanying circumstances – Your own presumption of what has happened – Any unusual events preceding the problem, etc.

Service label

The MOVITRANS® TPS10A units have a service label for the power section and one for the control unit. They are attached to the side of the unit next to the nameplate.

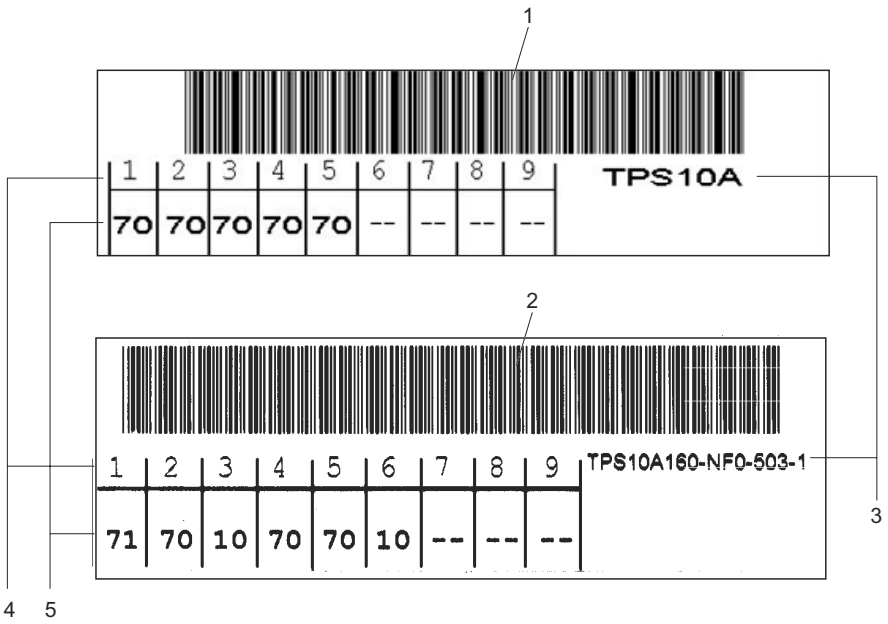

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Figure 18: Service label

[1] Service label for the control unit
[2] Service label for the power section
[3] Type designation
[4] Component / part
[5] Service code

6 Technical Data

6.1 General information

The following table contains the technical data that applies to all MOVITRANS® TPS10A stationary converters regardless of the size and power rating.

MOVITRANS® TPS10A	All sizes
Interference immunity	Meets EN 61800-3
Interference emission with EMC-compliant installation	Class A limit according to EN 55011 and EN 55014, meets EN 61800-3
Ambient temperature ϑ **Climate class**	0 °C... +40 °C EN 60721-3-3, class 3K3
Storage and shipping temperature[1] ϑ_L	–25 °C ... +75 °C (EN 60721-3-3, class 3K3)
Enclosure **size 2 (TPS10A040)** **size 4 (TPS10A160)**	IP20 IP00, IP10 with installed touch guard
Pollution class	2 according to IEC 60664-1 (VDE 0110-1)
Operating mode	DB (EN 60149-1-1 and 1-3)
Installation altitude	h ≤ 1000 m (3300 ft) I_{G_N} reduction: 1 % per 100 m (330 ft) of 1000 m (3300 ft) to max. 2000 m (6600 ft)
Resistance to vibration	Fulfills EN 50178
Relative humidity	≤ 95 %, no moisture condensation

1) For long-term storage, connect to power supply every two (2) years for at least 5 minutes, otherwise the unit's service life may be shortened.

6.2 Line filter

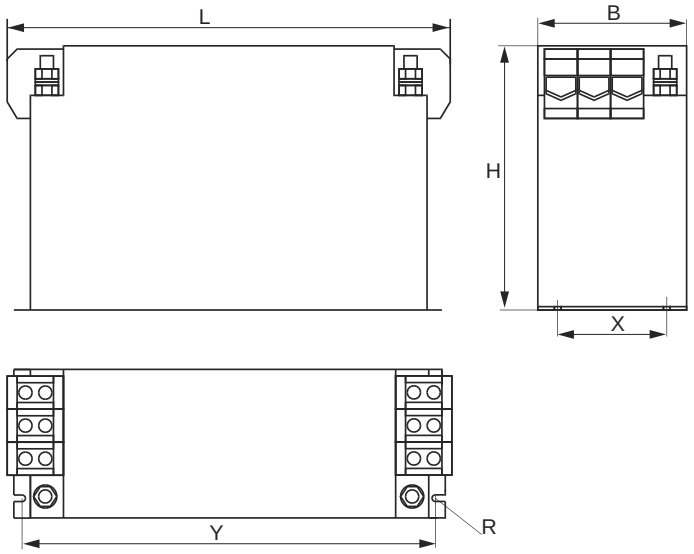

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Figure 19: Line filter

Type Part number	L_{max} [mm]	H_{max} [mm]	B_{max} [mm]	X [mm]	Y [mm]	R [mm]	Terminal [mm^2]	Ground stud	Current [A]
NF 014-503 827 116 X	225	80	50	20	210	5.5	4	M5	9
NF 035-503 827 128 3	275	100	60	30	255	5.5	10	M5	35

6.3 Unit data

MOVITRANS® TPS10A		TPS10A040-NF0-503-1	TPS10A160-NF0-503-1
Part number		826 979 3	826 980 7
		Input	
Supply voltage	V_{mains}	380 V_{AC} – 10 % ... 500 V_{AC} + 10 %	
Mains frequency	f_{mains}	50 Hz ... 60 Hz 5 %	
Rated mains current (at V_{mains} = 3 × 400 V_{AC})	I_{mains}	6.0 A_{AC}	24.0 A_{AC}
		Output	
Rated output power	P_N	4 kW	16 kW
Rated output current	I_{G_N}	10 A_{AC}	40 A_{AC}
Load current	I_L	7.5 A_{AC}	30.0 A_{AC}
Rated output voltage	U_{A_N}	400 V_{AC}	
Output frequency	f_A	25 kHz	
Gyrator impedance	X_G	53.3 Ω	13.3 Ω
		General	
Power loss at I_{G_N}	P_V	300 W	1800 W
Cooling air consumption		80 m^3/h (48 ft^3/min)	360 m^3/h (216 ft^3/min)
Mass		5.9 kg (12.98 lb)	26.3 kg (57.86 lb)
Dimensions	**W × H × T**	130 × 335 × 207 mm (5.12 × 13.19 × 8.15 in)	280 × 522 × 227 mm (11.02 × 20.55 × 8.94 in)

6.4 Electronics data

MOVITRANS® TPS10A		General electronics data	
Voltage supply **for setpoint potentiometer**	**X10:1** **X10:3**	REF1: +10 V +5 % / –0 %, I_{max} = 3 mA REF2: –10 V +0 % / –5 %, I_{max} = 3 mA	Reference voltages for setpoint potentiometer
Setpoint input I_{L1}X10:2 **AI11/AI12** **(differential input)**	**X10:4**	I_{L1} = –10 V ... +10 V ≙ 0 ... 100 % I_L Resolution: 10-bit, sampling time: 800 µs R_i = 40 kΩ (external voltage supply) R_i = 20 kΩ (supply from X10:1/X10:3)	I_{L1} = –40 ... +40 mA ≙ 0 ... 100 % I_L Resolution: 10-bit, sampling time: 800 µs R_i = 250 Ω
Auxiliary supply **output VO24[1)]**	**X10:16**	V = 24 V_{DC}, current carrying capacity: I_{max} = 200 mA	
External voltage **supply VI24[1)]**	**X10:24**	V_N = 24 V_{DC} –15 % / +20 % (range 19.2...30 V_{DC}) according to EN 61131-2	
Binary inputs DIØØDIØ5		Isolated via optocoupler (EN 61131-2), R_i ≈ 3.0 kΩ, I_E ≈ 10 mA PLC compatible, sampling time: 400 µs	
Signal level		+13 ... +30 V = "1" = Contact closed according to EN 61131-2 –3 ... +5 V = "0" = Contact open	
Control functions	**X10:9**	DIØØ: With fixed assignment /controller inhibit	
	X10:10	DIØ1: With fixed assignment /Ext. fault	
	X10:11	DIØ2: With fixed assignment Auto reset	
	X10:12	DIØ3: With fixed assignment Current control mode 1 / mode 2	
	X10:13	DIØ4: With fixed assignment Setpoint mode A	
	X10:14	DIØ5: With fixed assignment Setpoint mode B	
Binary outputs DOØØ and DOØ2[1)]		PLC compatible (EN 61131-2), response time: 400 µs **Important:** Do not apply external voltage! I_{max} = 50 mA (short-circuit proof)	
Signal level		"0" = 0 V, "1" = 24 V	
Control functions	**X10:19**	DOØ2: With fixed assignment /Fault	
	X10:21	DOØØ: With fixed assignment Ready for operation	
Reference terminals	**X10:8**	AGND: Reference potential for analog signals (AI11, AI12, REF1, REF2)	
	X10:17/X10:23	DGND: Reference potential for binary signals	
	X10:15	DCOM: Reference for binary inputs DIØØ ... DIØ5	
Permitted line cross section		Single core: 0.20 ... 1.5 mm^2 (AWG24...16) Double core: 0.20 ... 1 mm^2 (AWG24...17)	

1) The unit provides a current of I_{max} = 400 mA for 24 V_{DC} outputs X10:16 (VO24), X10:19 (DOØ2) and X10:21 (DOØØ). An external 24 V_{DC} supply (support voltage) can be connected so that the electronic components remain ready for operation even in case of a power supply interruption.

6.5 Dimensions

MOVITRANS® TPS10A040 – Size 2

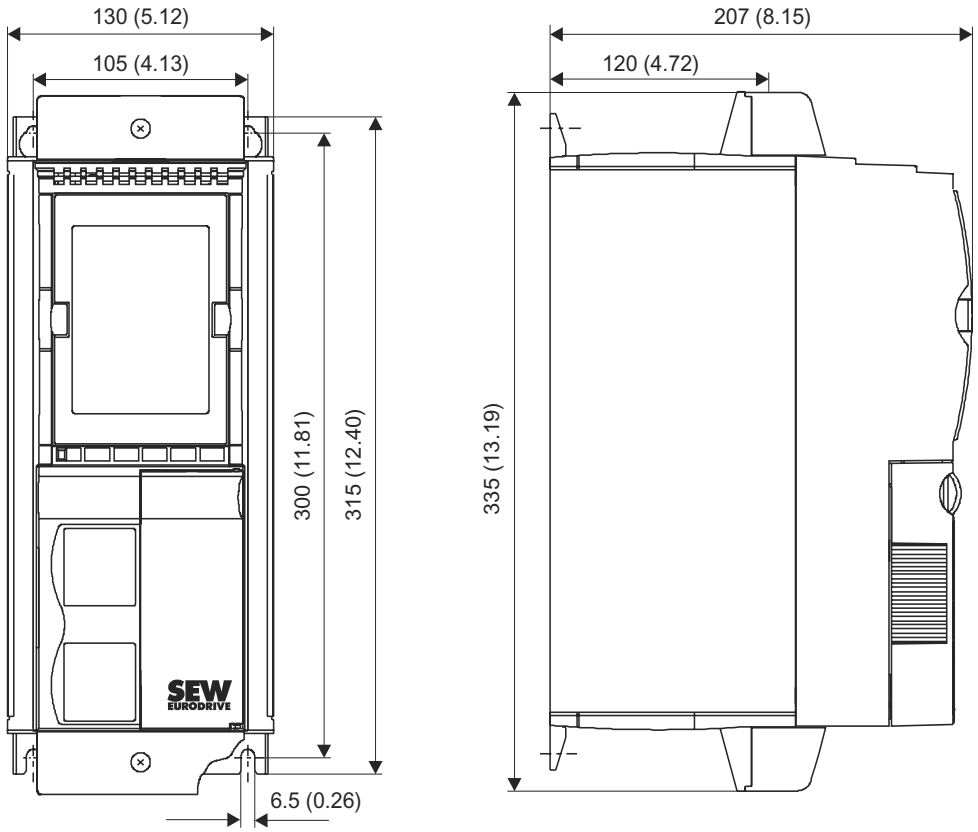

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Figure 20: Dimensions for MOVITRANS® TPS10A size 2, dimensions in mm (in)

MOVITRANS® TPS10A160 – Size 4

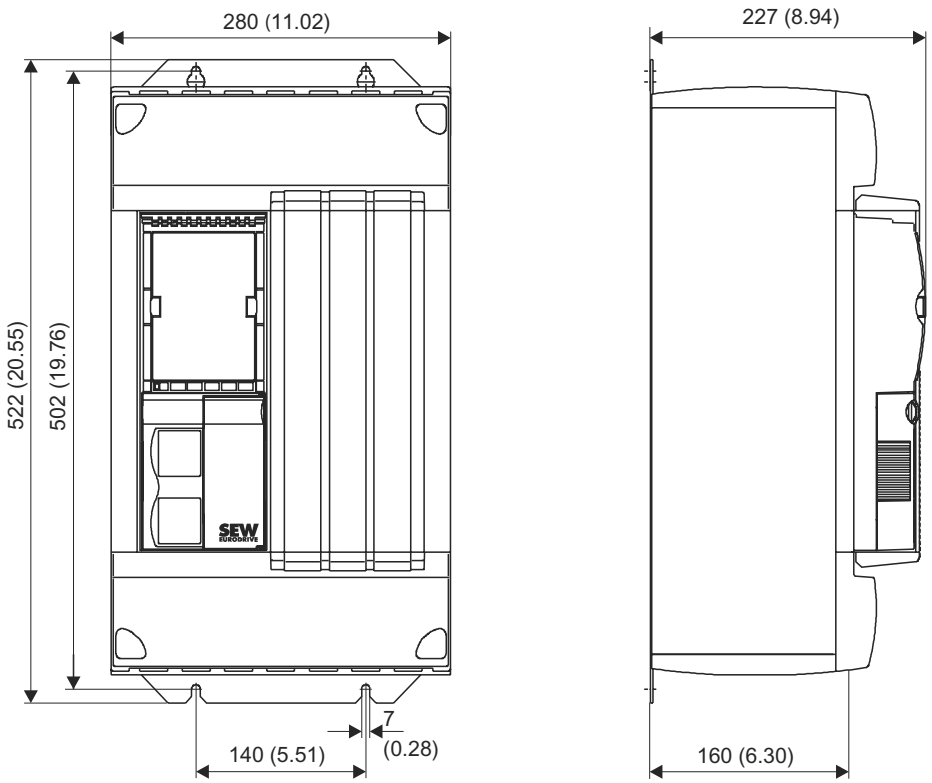

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Figure 21: Dimensions for MOVITRANS® TPS10A size 4, dimensions in mm (in)

Serial interface option type USS21A (RS-232)

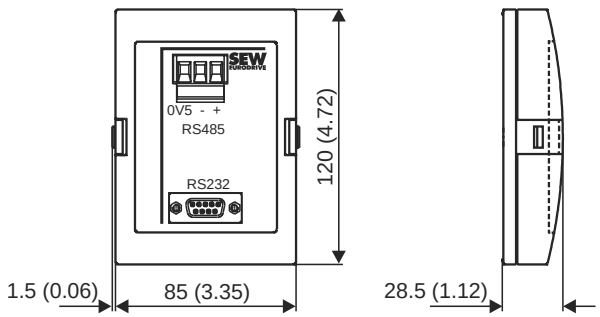

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Figure 22: Dimensions for option USS21A, in mm (in)

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Address List

Germany			
Headquarters **Production** **Sales**	**Bruchsal**	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 · D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Service **Competence Center**	**Central** Gear units / Motors	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 sc-mitte-gm@sew-eurodrive.de
	Central Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 sc-mitte-e@sew-eurodrive.de
	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 D-30823 Garbsen (near Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 sc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 D-08393 Meerane (near Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 sc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim (near München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 sc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld (near Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 sc-west@sew-eurodrive.de
	Drive Service Hotline / 24 Hour Service		+49 180 5 SEWHELP +49 180 5 7394357
	Additional addresses for service in Germany provided on request!		

France			
Production **Sales** **Service**	**Haguenau**	SEW-USOCOME 48-54, route de Soufflenheim B. P. 20185 F-67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocome.com sew@usocome.com
Assembly **Sales** **Service**	**Bordeaux**	SEW-USOCOME Parc d'activités de Magellan 62, avenue de Magellan - B. P. 182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
	Lyon	SEW-USOCOME Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15
	Paris	SEW-USOCOME Zone industrielle 2, rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
	Additional addresses for service in France provided on request!		

Algeria			
Sales	**Alger**	Réducom 16, rue des Frères Zaghnoun Bellevue El-Harrach 16200 Alger	Tel. +213 21 8222-84 Fax +213 21 8222-84

Argentina			
Assembly **Sales** **Service**	**Buenos Aires**	SEW EURODRIVE ARGENTINA S.A. Centro Industrial Garin, Lote 35 Ruta Panamericana Km 37,5 1619 Garin	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 sewar@sew-eurodrive.com.ar

Australia			
Assembly **Sales** **Service**	**Melbourne**	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au

Austria			
Assembly **Sales** **Service**	**Wien**	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://sew-eurodrive.at sew@sew-eurodrive.at

Belgium			
Assembly **Sales** **Service**	**Brüssel**	SEW Caron-Vector S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be

Brazil			
Production **Sales** **Service**	**Sao Paulo**	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 50 Caixa Postal: 201-07111-970 Guarulhos/SP - Cep.: 07251-250	Tel. +55 11 6489-9133 Fax +55 11 6480-3328 http://www.sew.com.br sew@sew.com.br
	Additional addresses for service in Brazil provided on request!		

Bulgaria			
Sales	**Sofia**	BEVER-DRIVE GmbH Bogdanovetz Str.1 BG-1606 Sofia	Tel. +359 2 9532565 Fax +359 2 9549345 bever@fastbg.net

Cameroon			
Sales	**Douala**	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 4322-99 Fax +237 4277-03

Canada			
Assembly **Sales** **Service**	**Toronto**	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, Ontario L6T3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.reynolds@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. 7188 Honeyman Street Delta. B.C. V4G 1 E2	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Street LaSalle, Quebec H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca
	Additional addresses for service in Canada provided on request!		

Chile			
Assembly **Sales** **Service**	**Santiago de Chile**	SEW-EURODRIVE CHILE LTDA. Las Encinas 1295 Parque Industrial Valle Grande LAMPA RCH-Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 75770-00 Fax +56 2 75770-01 ventas@sew-eurodrive.cl

China			
Production **Assembly** **Sales** **Service**	**Tianjin**	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25322611 gm-tianjin@sew-eurodrive.cn http://www.sew.com.cn

China			
Assembly **Sales** **Service**	**Suzhou**	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021 P. R. China	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew.com.cn

Colombia			
Assembly **Sales** **Service**	**Bogotá**	SEW-EURODRIVE COLOMBIA LTDA. Calle 22 No. 132-60 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 sewcol@andinet.com

Croatia			
Sales **Service**	**Zagreb**	KOMPEKS d. o. o. PIT Erdödy 4 II HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@net.hr

Czech Republic			
Sales	**Praha**	SEW-EURODRIVE CZ S.R.O. Business Centrum Praha Luná 591 CZ-16000 Praha 6 - Vokovice	Tel. +420 a220121236 Fax +420 220121237 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz

Denmark			
Assembly **Sales** **Service**	**Kopenhagen**	SEW-EURODRIVEA/S Geminivej 28-30, P.O. Box 100 DK-2670 Greve	Tel. +45 43 9585-00 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk

Estonia			
Sales	**Tallin**	ALAS-KUUL AS Paldiski mnt.125 EE 0006 Tallin	Tel. +372 6593230 Fax +372 6593231 veiko.soots@alas-kuul.ee

Finland			
Assembly **Sales** **Service**	**Lahti**	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi

Gabon			
Sales	**Libreville**	Electro-Services B.P. 1889 Libreville	Tel. +241 7340-11 Fax +241 7340-12

Great Britain			
Assembly **Sales** **Service**	**Normanton**	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate P.O. Box No.1 GB-Normanton, West- Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk

Greece			
Sales **Service**	**Athen**	Christ. Boznos & Son S.A. 12, Mavromichali Street P.O. Box 80136, GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr

Hong Kong			
Assembly **Sales** **Service**	**Hong Kong**	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 2 7960477 + 79604654 Fax +852 2 7959129 sew@sewhk.com

Hungary			
Sales **Service**	**Budapest**	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 office@sew-eurodrive.hu

India			
Assembly **Sales** **Service**	**Baroda**	SEW-EURODRIVE India Pvt. Ltd. Plot No. 4, Gidc Por Ramangamdi · Baroda - 391 243 Gujarat	Tel. +91 265 2831086 Fax +91 265 2831087 mdoffice@seweurodriveindia.com
Technical Offices	**Bangalore**	SEW-EURODRIVE India Private Limited 308, Prestige Centre Point 7, Edward Road Bangalore	Tel. +91 80 22266565 Fax +91 80 22266569 salesbang@seweurodriveinindia.com
	Mumbai	SEW-EURODRIVE India Private Limited 312 A, 3rd Floor, Acme Plaza Andheri Kurla Road, Andheri (E) Mumbai	Tel. +91 22 28348440 Fax +91 22 28217858 salesmumbai@seweurodriveindia.com

Ireland			
Sales **Service**	**Dublin**	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458

Israel			
Sales	**Tel-Aviv**	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 lirazhandasa@barak-online.net

Italy			
Assembly **Sales** **Service**	**Milano**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 2 96 9801 Fax +39 2 96 799781 sewit@sew-eurodrive.it

Ivory Coast			
Sales	**Abidjan**	SICA Ste industrielle et commerciale pour l'Afrique 165, Bld de Marseille B.P. 2323, Abidjan 08	Tel. +225 2579-44 Fax +225 2584-36

Japan			
Assembly **Sales** **Service**	**Toyoda-cho**	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Toyoda-cho, Iwata gun Shizuoka prefecture, 438-0818	Tel. +81 538 373811 Fax +81 538 373814 sewjapan@sew-eurodrive.co.jp

Korea			
Assembly **Sales** **Service**	**Ansan-City**	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate Unit 1048-4, Shingil-Dong Ansan 425-120	Tel. +82 31 492-8051 Fax +82 31 492-8056 master@sew-korea.co.kr

Latvia			
Sales	**Riga**	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 7139386 Fax +371 7139386 info@alas-kuul.ee

Lebanon			
Sales	**Beirut**	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 4947-86 +961 1 4982-72 +961 3 2745-39 Fax +961 1 4949-71 gacar@beirut.com

Lithuania			
Sales	**Alytus**	UAB Irseva Merkines g. 2A LT-62252 Alytus	Tel. +370 315 79204 Fax +370 315 56175 info@irseva.lt www.sew-eurodrive.lt

Luxembourg			
Assembly **Sales** **Service**	**Brüssel**	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be

Malaysia			
Assembly **Sales** **Service**	**Johore**	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 kchtan@pd.jaring.my

Mexico			
Assembly **Sales** **Service**	**Queretaro**	SEW-EURODRIVE, Sales and Distribution, S. A. de C. V. Privada Tequisquiapan No. 102 Parque Ind. Queretaro C. P. 76220 Queretaro, Mexico	Tel. +52 442 1030-300 Fax +52 442 1030-301 scmexico@seweurodrive.com.mx

Morocco			
Sales	**Casablanca**	S. R. M. Société de Réalisations Mécaniques 5, rue Emir Abdelkader 05 Casablanca	Tel. +212 2 6186-69 + 6186-70 + 6186-71 Fax +212 2 6215-88 srm@marocnet.net.ma

Netherlands			
Assembly **Sales** **Service**	**Rotterdam**	VECTOR Aandrijftechniek B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 http://www.vector.nu info@vector.nu

New Zealand			
Assembly **Sales** **Service**	**Auckland**	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz

Norway			
Assembly **Sales** **Service**	**Moss**	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 241-020 Fax +47 69 241-040 sew@sew-eurodrive.no

Peru			
Assembly **Sales** **Service**	**Lima**	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 sewperu@sew-eurodrive.com.pe

Poland			
Assembly **Sales** **Service**	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Lodz	Tel. +48 42 67710-90 Fax +48 42 67710-99 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl

Portugal			
Assembly **Sales** **Service**	**Coimbra**	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt

Romania			
Sales **Service**	**Bucuresti**	Sialco Trading SRL str. Madrid nr.4 011785 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro

Russia			
Sales	**St. Petersburg**	ZAO SEW-EURODRIVE P.O. Box 263 RUS-195220 St. Petersburg	Tel. +7 812 5357142 +812 5350430 Fax +7 812 5352287 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru

Senegal			
Sales	**Dakar**	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 849 47-70 Fax +221 849 47-71 senemeca@sentoo.sn

Serbia and Montenegro			
Sales	**Beograd**	DIPAR d.o.o. Kajmakcalanska 54 SCG-11000 Beograd	Tel. +381 11 3088677 / +381 11 3088678 Fax +381 11 3809380 dipar@yubc.net

Singapore			
Assembly **Sales** **Service**	**Singapore**	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 sewsingapore@sew-eurodrive.com

Slovakia			
Sales	**Sered**	SEW-Eurodrive SK s.r.o. Trnavska 920 SK-926 01 Sered	Tel. +421 31 7891311 Fax +421 31 7891312 sew@sew-eurodrive.sk

Slovenia			
Sales **Service**	**Celje**	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 SLO – 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net

South Africa			
Assembly **Sales** **Service**	**Johannesburg**	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 dross@sew.co.za
	Capetown	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 dswanepoel@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaceo Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 dtait@sew.co.za

Spain			
Assembly **Sales** **Service**	**Bilbao**	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 9 4431 84-70 Fax +34 9 4431 84-71 sew.spain@sew-eurodrive.es

Sweden			
Assembly **Sales** **Service**	**Jönköping**	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442-00 Fax +46 36 3442-80 http://www.sew-eurodrive.se info@sew-eurodrive.se

Switzerland			
Assembly **Sales** **Service**	**Basel**	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 41717-17 Fax +41 61 41717-00 http://www.imhof-sew.ch info@imhof-sew.ch

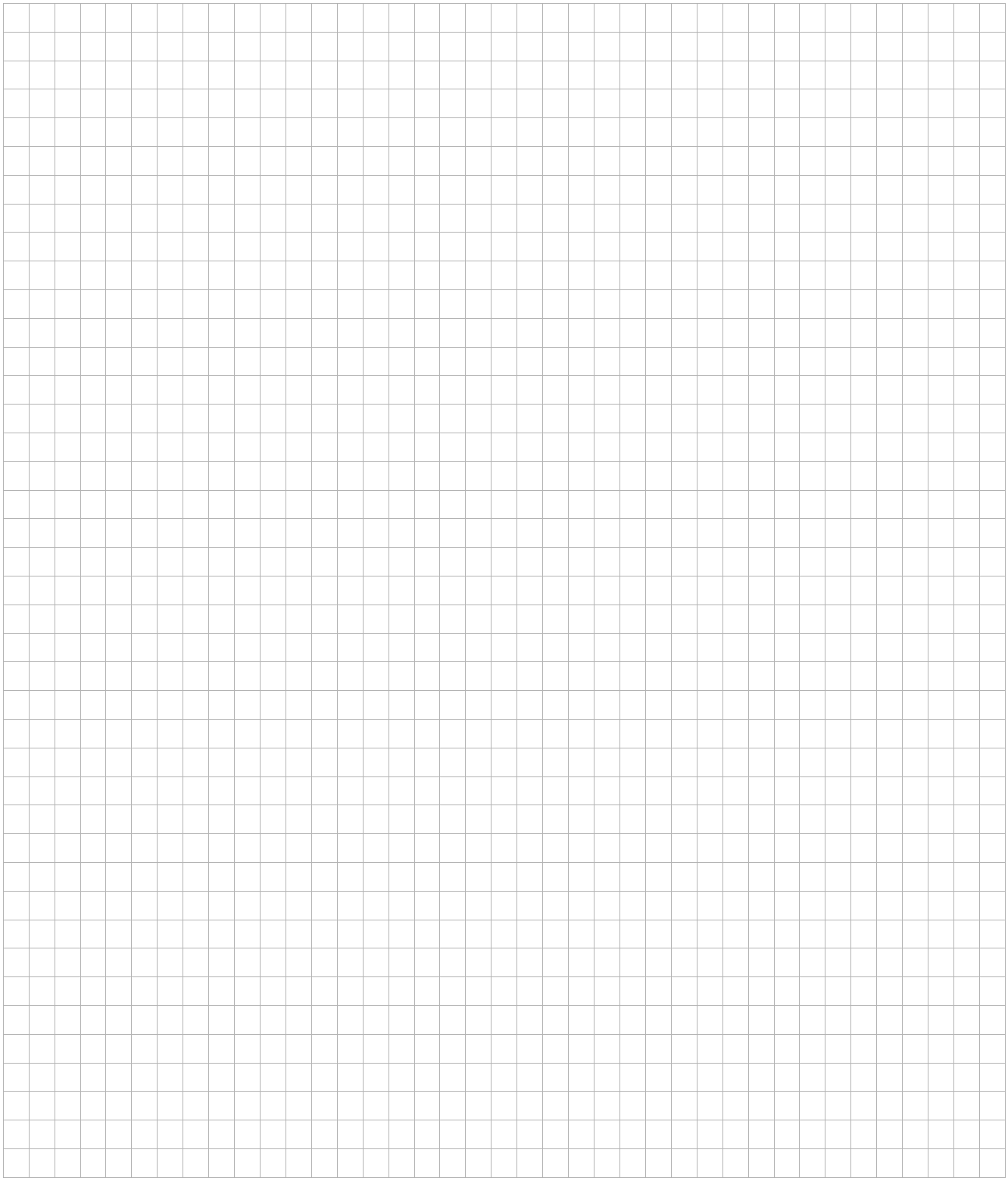
Thailand			
Assembly **Sales** **Service**	**Chon Buri**	SEW-EURODRIVE (Thailand) Ltd. Bangpakong Industrial Park 2 700/456, Moo.7, Tambol Donhuaroh Muang District Chon Buri 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.co.th

Tunisia			
Sales	**Tunis**	T. M.S. Technic Marketing Service 7, rue Ibn EI Heithem Z.I. SMMT 2014 Mégrine Erriadh	Tel. +216 1 4340-64 + 1 4320-29 Fax +216 1 4329-76

Turkey			
Assembly **Sales** **Service**	**Istanbul**	SEW-EURODRIVE Hareket Sistemleri Sirketi Bagdat Cad. Koruma Cikmazi No. 3 TR-34846 Maltepe ISTANBUL	Tel. +90 216 4419163 + 216 4419164 + 216 3838014 Fax +90 216 3055867 sew@sew-eurodrive.com.tr

USA			
Production **Assembly** **Sales** **Service**	**Greenville**	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manuf. +1 864 439-9948 Fax Ass. +1 864 439-0566 Telex 805 550 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly **Sales** **Service**	**San Francisco**	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, California 94544-7101	Tel. +1 510 487-3560 Fax +1 510 487-6381 cshayward@seweurodrive.com
	Philadelphia/PA	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Dayton	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 440-3799 cstroy@seweurodrive.com
	Dallas	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Additional addresses for service in the USA provided on request!		

Venezuela			
Assembly **Sales** **Service**	**Valencia**	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 sewventas@cantv.net sewfinanzas@cantv.net



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